What is claimed is:

1.   A packet transfer device that interworks an MPLS network which uses
multiprotocol label switching (hereinafter referred to as "MPLS"), and a network that
5   does not use said MPLS protocol, wherein:

in said MPLS network, packet switching is performed by the MPLS header
which is added before the header of the layer corresponding to layer 3 of the Open
System Interconnection (OSI) model (hereinafter referred to as "layer 3 header"); and

in a network which does not use said MPLS protocol, packet switching is
10   performed by the header of the layer corresponding to layer 2 of the OSI model
(hereinafter referred to as "layer 2 header"), which is different from said MPLS header
and is added before said layer 3 header,

wherein said device comprising:

a first physical port which receives a packet that is transmitted from a network
15   which does not use said MPLS protocol;

a second physical port for connecting with said MPLS network;

memory that stores the header transformation information that shows the
correspondence between a pair of the information in said layer 2 header and the
information in said layer 3 header, and the information in said MPLS header; and

20   a processor that searches said header transformation information and transforms
said layer 2 header contained in a packet received from said first physical port to said
MPLS header corresponding to it.

2.   The packet transfer device recited in claim 1, wherein:

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the information in said layer 2 header is the information that identifies the groups

to which the transmission source and destination of a packet that is transmitted from a

network which does not use said MPLS protocol belong; and

the information in said MPLS header is the label value in said MPLS header.

5   3.   The packet transfer device recited in claim 2, wherein:

a physical port number is assigned to said first physical port; and

said header transformation information shows the correspondence between a

group of said physical port number, the information that identifies the groups to which

the transmission source and destination of a packet transmitted from a network which

10   does not use said MPLS protocol belong and the information in said layer 3 header, and

said label value.

4.   The packet transfer device recited in claim 1, wherein:

said layer 2 header and said MPLS header each contain packet priority

information;

15   a packet that is transferred in said MPLS network and a packet that is transferred

in a network which does not use said MPLS protocol have, after said layer 3 header, the

header of the layer that corresponds to layer 4 of the OSI model (hereinafter referred to

as "layer 4 header"),

wherein said device comprising:

20   memory that stores the priority transformation information that shows either the

correspondence between a pair of said packet priority information in said layer 2 header

and either the information in said layer 3 header or the information in said layer 4 header,

and said priority information in said MPLS header; or the correspondence between a

group of the packet priority information in said layer 2 header, the information in said

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layer 3 header and the information in said layer 4 header, and said priority information in said MPLS header,

wherein said processor searches said priority transformation information and transforms said priority information in said layer 2 header contained in a packet received

5   from said first physical port to said priority information in said MPLS header corresponding to it.

5.   A packet transfer device that interworks an MPLS network which uses multiprotocol label switching (hereinafter referred to as "MPLS") and a network that does not use said MPLS protocol, wherein:

10   in said MPLS network, packet switching is performed by the MPLS header which is added before the header of the layer corresponding to layer 3 of the Open System Interconnection (OSI) model (hereinafter referred to as "layer 3 header"); and

in a network which does not use said MPLS protocol, packet switching is performed by the header of the layer corresponding to layer 2 of the OSI model

15   (hereinafter referred to as "layer 2 header"), which is different from said MPLS header and is added before the header of the layer corresponding to layer 3 of the OSI model (hereinafter referred to as "layer 3 header"),

wherein said device comprising:

a first physical port which receives a packet that is transmitted from said MPLS

20   network;

a second physical port for connecting with a network which does not use said MPLS protocol;

memory that stores the header transformation information that shows the correspondence between a pair of said MPLS header information and the information in

25   said layer 3 header, and the information in said layer 2 header; and

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a processor that searches said header transformation information and transforms said layer 2 header contained in a packet received from said first physical port to said MPLS header corresponding to it.

6.   The packet transfer device recited in claim 5, wherein:

5   the information in said MPLS header is the label value in said MPLS header; and

the information in said layer 2 header is the information that identifies the groups to which the transmission source and destination of a packet that is transmitted from a network which does not use said MPLS protocol belong.

7.   The packet transfer device recited in claim 6, wherein:

10   a physical port number is assigned to said first physical port; and

said header transformation information shows the correspondence between a group of said physical port number, the value of said label and the information in said layer 3 header, and the information that identifies the groups to which the transmission source and destination of a packet transmitted from a network which does not use said

15   MPLS protocol belong.

8.   The packet transfer device recited in claim 5, wherein:

said layer 2 header and said MPLS header each contain packet priority information; and

a packet that is transferred in said MPLS network and a packet that is transferred

20   in a network which does not use said MPLS protocol have, after said layer 3 header, the header of the layer corresponding to layer 4 of the OSI model (hereinafter referred to as "layer 4 header"),

wherein said device comprising:

memory that stores the priority transformation information that shows either the

25   correspondence between a pair of said packet priority information in said MPLS header

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and either the information in said layer 3 header or the information in said layer 4 header, and said priority information in said layer 2 header; or the correspondence between a group of the packet priority information in said MPLS header, the information in said layer 3 header and the information in said layer 4 header, and said priority information in

5   said layer 2 header,

wherein said processor searches said priority transformation information and transforms said priority information in said MPLS header contained in a packet received from said first physical port to said priority information in said layer 2 header corresponding to it.

10   9.   The packet transfer device recited in claim 8, wherein:

said MPLS header is a shim header; and

the priority information used in said MPLS network is set to the 3-bit Exp field defined in said shim header.

10.   The packet transfer device recited in claim 8, wherein:

15   said MPLS header is an ATM cell header; and

the priority information used in said MPLS network is set to the cell loss priority bit (CLP) field defined in said ATM cell header.

11.   The packet transfer device recited in claim 6, wherein:

the tag control information field defined by IEEE 802.1Q is set in said layer 2

20   header; and

the information that identifies the groups to which the transmission source and destination of a packet transmitted from a network which does not use said MPLS protocol belong is the VLAN ID that is set in said tag control information field.

12.   The packet transfer device recited in claim 6, wherein:

the tag control information field defined by IEEE 802.1Q is set in said layer 2 header; and

the packet priority information in said layer 2 header is the user priority that is set in said tag control information field.

5   13.   A packet transfer control method in a packet transfer device that interworks an MPLS network which uses multiprotocol label switching (hereinafter referred to as "MPLS") and a network that does not use said MPLS protocol, wherein:

in said MPLS network, packet switching is performed by the label in the MPLS header which is added before the header of the layer corresponding to layer 3 of the

10   Open System Interconnection (OSI) model (hereinafter referred to as "layer 3 header");

in a network which does not use said MPLS protocol, packet switching is performed by the header of the layer corresponding to layer 2 of the OSI model (hereinafter referred to as "layer 2 header"), which is different from said MPLS header and is added before said layer 3 header; and

15   a plurality of logical networks that are identified by the identifier in said layer 2 header are configured in the network which does not use said MPLS protocol,

wherein said method comprising the steps of:

setting the correspondence between said identifier and said label in said packet device;

20   determining to which network among said plurality of logical networks a received packet belongs, using said identifier in said layer 2 header that is added to the received packet, when the packet is received from the network which does not use said MPLS protocol;

checking said correspondence;

determining said label to be added to said received packet;

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checking said correspondence when the packet is received from said MPLS network;

determining said identifier to be associated to said label added to said received packet in said MPLS network; and

5   determining to which network among said plurality of logical networks said received packet is to be transmitted from said MPLS network.

14.   The packet transfer control method recited in claim 13, wherein:

said layer 2 header is a VLAN packet header defined by IEEE 802.1Q;

said identifier is the value that is set in the VLAN ID field; and

10   said layer 3 header is an Internet protocol (IP) header.

15.   The packet transfer control method recited in claim 13, wherein:

said layer 2 header contains the priority information for the packet transfer in the network which does not use said MPLS protocol; and

said MPLS header contains the priority information for the packet transfer in said

15   MPLS network,

wherein said method comprising the step of:

transforming said priority information in said layer 2 header to said priority information in said MPLS header.

16.   The packet transfer control method recited in claim 15, wherein:

20   said layer 2 header is a VLAN packet header defined by IEEE 802.1Q;

said priority information in said layer 2 header is the value that is set in the user priority field;

said MPLS header is a shim header; and

the priority information in said MPLS header is the value of the 3-bit Exp field.

25   17.   The packet transfer control method recited in claim 15, wherein:

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said layer 2 header is a VLAN packet header defined by IEEE 802.1Q;

said priority information in said layer 2 header is the value that is set in the user priority field;

said MPLS header is an ATM cell header; and

5   the priority information in said MPLS header is the value of the cell loss priority bit (CLP) field.

18.   The packet transfer control method recited in claim 16, wherein:

said layer 3 header is an Internet protocol (IP) header.

19.   A setup method for a packet transfer device that interworks an MPLS network in

10 which packet switching is performed by the multiprotocol label switching (hereinafter referred to as "MPLS") header and a network in which packet switching is performed by a VLAN packet header defined by IEEE 802.1Q, wherein:

said MPLS header possesses a label that is the connection identifier of said MPLS network, and the priority information for the packet transfer in said MPLS

15 network,

wherein said method comprising the steps of:

setting the correspondence between the value to be set to the VLAN ID field in said VLAN packet header and the label in said MPLS header; and

setting the correspondence between the value to be set to the user priority field in

20 said VLAN packet header and said priority information in said MPLS header.